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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2000																																																		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program																																																					
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost																																																
Total Program Element (PE) Cost	14452	32211	12365	12078	9995	18804	16207	Continuing	Continuing																																																
D036 Patriot RDT&E	8803	7702	6699	4515	4737	9863	7960	Continuing	Continuing																																																
D038 Avenger Product Improvement Program	0	0	0	2001	0	4185	0	0	6186																																																
D303 Stinger RMP Product Improvement Program	5649	24509	5666	5562	5258	4756	7427	Continuing	Continuing																																																
D633 THAAD P3I	0	0	0	0	0	0	820	Continuing	Continuing																																																
<p>A. Mission Description and Budget Item Justification: The goal of the Air Defense Artillery (ADA) modernization is to provide the most capable systems to well-trained soldiers at the right time to defeat the evolving threat. The ADA systems under this Program Element achieve the Air and Missile Defense (AMD) force which will assist the Army and the joint force in gaining Full Spectrum Dominance in any operational requirement, from smaller-scale contingency operations to major theater wars (MTW). ADA must continually be upgraded and modernized to meet these challenges. The FY00-FY01 budget funds critical improvements to the Patriot and the Stinger.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">B. Program Change Summary</th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget (FY 2000/2001 PB)</td> <td style="text-align: center;">15151</td> <td style="text-align: center;">29985</td> <td style="text-align: center;">28649</td> </tr> <tr> <td>Appropriated Value</td> <td style="text-align: center;">15252</td> <td style="text-align: center;">32485</td> <td></td> </tr> <tr> <td>Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> </tr> <tr> <td>a. Congressional General Reductions</td> <td style="text-align: center;">-101</td> <td></td> <td></td> </tr> <tr> <td>b. SBIR / STTR</td> <td style="text-align: center;">-398</td> <td></td> <td></td> </tr> <tr> <td>c. Omnibus or Other Above Threshold Reductions</td> <td></td> <td style="text-align: center;">-133</td> <td></td> </tr> <tr> <td>d. Below Threshold Reprogramming</td> <td style="text-align: center;">-241</td> <td></td> <td></td> </tr> <tr> <td>e. Rescissions</td> <td style="text-align: center;">-60</td> <td style="text-align: center;">-141</td> <td></td> </tr> <tr> <td>Adjustments to Budget Years Since FY 2000/2001 PB</td> <td></td> <td></td> <td style="text-align: center;">-1576</td> </tr> <tr> <td>New Army Vision/Transformation Adjustment</td> <td></td> <td></td> <td style="text-align: center;">-14708</td> </tr> <tr> <td>Current Budget Submit (FY 2001 PB)</td> <td style="text-align: center;">14452</td> <td style="text-align: center;">32211</td> <td style="text-align: center;">12365</td> </tr> </tbody> </table> <p>Change Summary Explanation: Funding - FY 2001 Project D303 was adjusted (-14708) to reflect funds migration to support the New Army Transformation.</p>										B. Program Change Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	Previous President's Budget (FY 2000/2001 PB)	15151	29985	28649	Appropriated Value	15252	32485		Adjustments to Appropriated Value				a. Congressional General Reductions	-101			b. SBIR / STTR	-398			c. Omnibus or Other Above Threshold Reductions		-133		d. Below Threshold Reprogramming	-241			e. Rescissions	-60	-141		Adjustments to Budget Years Since FY 2000/2001 PB			-1576	New Army Vision/Transformation Adjustment			-14708	Current Budget Submit (FY 2001 PB)	14452	32211	12365
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program				PROJECT D036	
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D036 Patriot RDT&E	8803	7702	6699	4515	4737	9863	7960	Continuing	Continuing

A. Mission Description and Justification: D036 - Patriot Product Improvement Program The Patriot system is being upgraded through a series of individual materiel changes (MC) culminating in the attainment of the Patriot Advanced Capability - 3 (PAC-3) system. The communication upgrades improve Patriot's above and below battalion communication equipment. These changes eliminate Patriot peculiar communications equipment and improve Patriot's interoperability between systems and between the Services. FY00 will be the first year for the Remote Launch Communication Enhancement Upgrade (RLCEU) Link 16 Phase 1 and Post Deployment Build 5 (PDB5). RLCEU Link 16 will develop and test the hardware required for a Link-16 terminal, terminal control and communications processing equipment required to receive and process the Link 16 Joint Data Net information. PDB 5 will improve system capability against advanced threats (Theater Ballistic Missiles and Air-Breathing Threats (TBMs and ABTs) in all environments to include clutter and/or intense Electronic Counter Measures (ECM). Program objective will be to define the software changes necessary to enhance system capabilities against advanced TBM threat and advanced cruise missile threats. In addition, interoperability improvements [e.g., Cooperative Engagement Capability (CEC) interface, cueing, and Tactical Data Information Link (TADIL-J) direct to Fire Unit (FU)], PAC-3 missile integration improvements in ground software Classification Discrimination & Identification (CDI3) enhancements, and on-line diagnostic evolution will be addressed.

FY 1999 Accomplishments:

- 5435 P3I test program
- 600 Responsive threat analysis
- 2768 Horizontal Battlefield Digitization

Total 8803

FY 2000 Planned Program:

- 2452 RLCEU Link 16 Phase I
- 5042 PDB 5
- 208 Small Business Innovation Research/Small Business Technology Transfer Program

Total 7702

FY 2001 Planned Program:

- 2452 RLCEU Link 16 Phase I
- 4247 Post PDB 5

Project D036

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<p>C. Acquisition Strategy: The design objective of the Patriot system was to provide a baseline system capable of being modified to cope with the evolving threat. This alternative minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. The Patriot program consists of two interrelated acquisition programs - the Patriot growth program and the PAC-3 missile program. Growth program modifications are grouped into configurations, which are scheduled to be fielded in the same time frame. Configuration groupings are convenient for managing block changes of hardware and software and are not a performance-related grouping. However, incremental increases in performance will be determined for each configuration in order to provide benchmarks for configuration testing and for the development of user doctrine and tactics.</p>																																																																									
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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 2000		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program					PROJECT D036		

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. DAAH0182CA181		Raytheon/MA	3722							Cont	3722	
b. DAAH0187CA025		Raytheon/MA	22455							Cont	22455	
c. DAAH0189C0458		Raytheon/MA	23228							Cont	23228	
d. DAAH0192C0036		Raytheon/MA	5000							Cont	5000	
e. Small Contracts			1168							Cont	1168	
f. DAAH0187CA006		General Electric/FL	4824							Cont	4824	
g. DAAH0189C0167		Brunswick/Martin Marietta	3100							Cont	3100	
h. DAAH0192C0301	SS/CPFF	Lockheed-Martin/AL	4314							Cont	4314	
i. DAAH0191C0602	SS/CPIF	Raytheon/MA	23077							Cont	23077	
j. DAAH0192C0006	SS/CPAF	Raytheon/MA	56460							Cont	56460	
k. DAAH0195C0043	SS/CPAF	Raytheon/MA	16113	400	Dec 98					Cont	16513	
l. DAAH0196C0406		Lockheed Martin/AL	200							Cont	200	
m. DAAH0196C0062		Raytheon/MA	62937							Cont	62937	
n. DAAH0196C0018		Raytheon/MA	5046							Cont	5046	
o. RLCEU Link 16 Phase I						1226	Dec 99	1226	Dec 00	Cont	2452	
p. Horiz Btlfld Digit				2768	Feb 99					Cont	2768	
q. Post PBD 5						2060	Feb 00	1654	Feb 01	Cont	3714	
r. RAM Improvements												
Subtotal Product Development:			231644	3168		3286		2880			240978	

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. DAAH0187CA008		CAS, Inc/AL	2270								2270	
b. DAAH0190C0487		CAS, Inc/AL	6266								6266	
c. DAAH0194C0105	C/CPAF	CAS, Inc/AL	6135								6135	

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ARMY RDT&E COST ANALYSIS (R-3)

DATE

February 2000

BUDGET ACTIVITY

7 - Operational System Development

PE NUMBER AND TITLE

**0203801A Missile/Air Defense Product
Improvement Program**

PROJECT

D036

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
d. DAAH0197C0324		CAS,Inc/AL	2737	791							3528	
e. In-House Support		RSA/AL	11920	1095		941	Mar 00	858	Mar 01		14814	
f. Matrix Support		RSA/AL	1250	950		800	Feb 00	700	Feb 01		3700	
Subtotal Support Costs:			30578	2836		1741		1558			36713	

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Missile Command	1095	RSA/AL	11428	250	Mar 99	2062	Mar 00	1661	Mar 01	Cont	15401	
b. White Sands Missile Range	MIPR	WSMR/NM	11725	1309	Jan 99	613	Jan 00	600	Jan 01	Cont	14247	
c. Other Govt Agent	MIPR		9063	1240	Feb 99					Cont	10303	
d. RDEC and Other Govt Agent	1095/MIPR	RSA/AL	95377							Cont	95377	
Subtotal Test and Evaluation:			127593	2799		2675		2261			135328	

Project Total Cost:			389815	8803		7702		6699			413019	
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Project D036

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Exhibit R-3 (PE 0203801A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program				PROJECT D303	

COST (<i>In Thousands</i>)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D303 Stinger RMP Product Improvement Program	5649	24509	5666	5562	5258	4756	7427	Continuing	Continuing

A. Mission Description and Justification: This project provides a product evolution of the Stinger-RMP to improve countermeasures capability via externally loaded software, which is downloaded from a reprogrammable module. This concept allows for timely upgrades to correct system deficiencies, rapid reaction to new threats or threat countermeasures, development of specialty software programs where full capability may not be desired, and accommodation of new missions. The Block I upgrade project, which adds a roll sensor and enhanced software, extends the missile service life, solves system performance deficiencies in countermeasures and other engagement conditions, and increases terminal accuracy. The Block II development program was terminated due to higher priority requirements of the New Army Transformation. However, critical evaluation of Block I improvements and performance will continue.

FY 1999 Accomplishments:

- 1400 Built and Evaluated Block II Guidance Sections
- 1773 Hardware-in-the-Loop Flight Simulation Development, Missile Airframe and Missile Simulation Analyses
- 300 Continued Telemetry Development
- 500 Rate Sensor Evaluation
- 1676 Conducted performance prediction, weapon system integration, and preparation for entry into EMD

Total 5649

FY 2000 Planned Program:

- 3000 STINGER Block II Program Termination & Technology Transition
- 550 AIM9X & RAM Technology Evaluation (Producibility & Obsolescence Reduction)
- 150 Lithium Battery Evaluation (Shelf Life Extension)
- 17653 Support the New Army Transformation
- 2500 Congressional increase erroneously appropriated to this program element. Action pending to correctly reclassify funds for the SWORD program.
- 656 Small Business Innovation Research/Small Business Technology Transfer Program

Total 24509

FY 2001 Planned Program:

- 910 Dual Detector Aging/Degradation Test, Evaluation and Analysis

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<ul style="list-style-type: none"> • 3600 Hybrid Microelectronic Assembly (HMA) Redesign <p>FY 2001 Planned Program: (continued)</p> <ul style="list-style-type: none"> • 125 Lithium Battery Aging Test • 275 Primary and Secondary Seeker Spin Motor and Squibs Evaluation • 265 Guidance Section Software Development (HMA Redesign) • 491 Missile Airframe/Guidance Section Modeling and Simulation Analyses and Performance Predictions <p>Total 5666</p>																																																																								
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Budget Activity 3 – Stinger Mods (C21300)	13416	21858	21838	27459	27077	32179	35539	Cont'd	Cont'd																																																															
<p>C. Acquisition Strategy: The Block I development program is a Sole Source/Cost Plus Incentive Fee contract awarded in 1992. The Block II development began FY 1993 as a Technology Base Broad Agency announcement with a SS/CPFF contract. A SS/CPFF contract was awarded 1996 for pre-Engineering, Manufacturing and Development (EMD). A SS/CPFF contract was awarded mid-FY 1997 for the MIL-STD Launcher electronics development. The VSHORADS/SHORADS Competitive/Firm Fixed Price contract was awarded to two international consortia; the United Kingdom was designated as the Pilot Nation, serving as contracting authority. Due to termination of the Block II development program and redefinition of activities to fund critical evaluation of Block I improvements and performance, a contract for follow-on Stinger Block I improvements will be awarded in 2Q FY2000.</p>																																																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 5px;">D. Schedule Profile</th> <th style="text-align: center; padding: 5px;"><u>FY 1999</u></th> <th style="text-align: center; padding: 5px;"><u>FY 2000</u></th> <th style="text-align: center; padding: 5px;"><u>FY 2001</u></th> <th style="text-align: center; padding: 5px;"><u>FY 2002</u></th> <th style="text-align: center; padding: 5px;"><u>FY 2003</u></th> <th style="text-align: center; padding: 5px;"><u>FY 2004</u></th> <th style="text-align: center; padding: 5px;"><u>FY 2005</u></th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Block II Guidance Section Build/Evaluation</td> <td style="text-align: center;">3Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Block II Missile Simulation Development</td> <td style="text-align: center;">3Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Block I Contract Award</td> <td></td> <td style="text-align: center;">2Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">AIM9X & RAM Technology Evaluation</td> <td></td> <td style="text-align: center;">2-4Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Lithium Battery Evaluation/Test</td> <td></td> <td style="text-align: center;">4Q</td> <td style="text-align: center;">2-4Q</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Dual Detector Evaluation</td> <td></td> <td></td> <td style="text-align: center;">2-4Q</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">HMA Redesign</td> <td></td> <td></td> <td style="text-align: center;">2-4Q</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>									D. Schedule Profile	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	Block II Guidance Section Build/Evaluation	3Q							Block II Missile Simulation Development	3Q							Block I Contract Award		2Q						AIM9X & RAM Technology Evaluation		2-4Q						Lithium Battery Evaluation/Test		4Q	2-4Q					Dual Detector Evaluation			2-4Q					HMA Redesign			2-4Q				
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ARMY RDT&E COST ANALYSIS (R-3)

DATE

February 2000

BUDGET ACTIVITY

7 - Operational System Development

PE NUMBER AND TITLE

0203801A Missile/Air Defense Product
Improvement Program

PROJECT

D303

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. DAAH0192C0213	SS-CPIF	Hughes,Tucson,AZ	20838							0	20838	
b. DAAH0193CR127	SS-CPFF	Hughes,Tucson,AZ	4629							0	4629	
c. DAAH0195C0028	SS-CPFF	Hughes,Tucson,AZ	1965							0	1965	
d. DAAH0196C0180	SS-CPFF	Hughes,Tucson,AZ	16837	902	2Q					0	17739	
e. DAAH0197C0084	SS-CPFF	Raytheon(Hughes), Tucson,AZ	1000							0	1000	
f. DAAH0197C0099	SS-CPFF	Raytheon, Tucson,AZ	3101	1698	2Q					0	4799	
g. DAAH0199C0170 Transition From Block II to Block I Technology Evaluations	SS-CPFF	Raytheon, Tucson,AZ				1921	2Q	2959	2Q	Cont'd	4880	
h. Block I Aggregate	Various	Various	7025							0	7025	
i. BSFV Aggregate	Various	Various	8569							0	8569	
j. Government Engineering Support	1095	RDEC, Redstone Arsenal, AL	5382	1190	3Q	1175	2Q	1810	1Q	Cont'd	9557	
k. SBIR/STTR						656					656	
l. SWORD (will be re-aligned to PE 0602303A)						2500					2500	
m. Support the New Army Transformation						17653					17653	
n. Other Govt. Agency	MIPR/1095	Various	406	7	1Q			100	1Q	Cont'd	513	
Subtotal Product Development:			69752	3797		23905		4869			102323	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 2000		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program						PROJECT D303		

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. DAAH0195CA032	SS-FFP	Sigma Tech, Huntsville, AL	1198							0	1198	
b. OSD MOU (Barclay Bank 42779277)	SS/C-FFP & 1080	United Kingdom Ministry of Defense	4090							0	4090	
Subtotal Support Costs:			5288								5288	

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Test Demonstration	MIPR	Eglin AFB, FL	2100	73	2Q	121	3Q	187	2Q	Cont'd	2481	
b. Telemeters	1095	RTTC, Redstone Arsenal, AL	1004	800	4Q					Cont'd	1804	
c. Test Instrumentation	MIPR	NSWC, Dahlgren, VA		30	3Q						30	
d. Test Bed	MIPR	SMDC, Huntsville, AL		170	2Q						170	
Subtotal Test and Evaluation:			3104	1073		121		187			4485	

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Project Management	In-House	SHORAD PMO, DSA AMCOM	1331	326	1Q	483	2Q	483	1Q	Cont'd	2623	
b. DLA90093D00121	SS-FFP	II TRI, Huntsville, AL	775							0	775	
c. Contracted Services	Various	Various	333	453	3Q			127	1Q	Cont'd	913	
Subtotal Management Services:			2439	779		483		610			4311	

Project Total Cost:			80583	5649		24509		5666			116407	
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